Claims

1. **A compound of the formula**

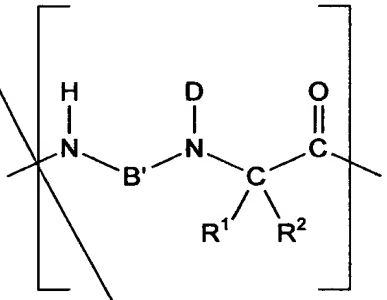
W-U-Z

in which W is a hydrogen atom, an amino acid unit, or a PNA unit,

U contains at least one unit of the formula Y and, optionally, one or more amino acid and/or PNA units,

Z is an OH function, an amino acid unit, or a PNA unit,

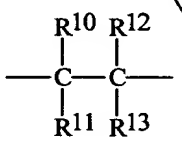
Y is a unit of the formula



Y

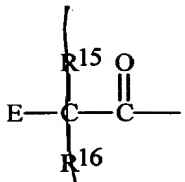
in which

B' is a group of the formula,



D is a group of the formula

sub C1



the residues R^{10} to R^{13} independently contain up to 20 carbon atoms and independently denote hydrogen atoms or unsubstituted alkyl, alkenyl, alkaryl, aryl, or alicyclic groups, said group being branched or unbranched, and optionally two each of the residues R^{10} to R^{13}, separated from each other by up to two carbon atoms, are components of a common ring system, which ring system is either an alicyclic monocyclic compound (3-8 ring atoms), optionally substituted by a branched or unbranched C_{1-5} alkyl group, or a phenyl ring,

the residues R^{15} and R^{16} independently contain up to 20 carbon atoms and independently denote hydrogen atoms or unsubstituted alkyl, alkenyl, alkaryl, aryl, or alicyclic groups, said groups being branched or unbranched, and optionally the residues R^{15} and R^{16} are components of a common ring system, which ring system is an alicyclic monocyclic compound (3-6 ring atoms), optionally substituted by a branched or unbranched C_{1-5} alkyl group,

E is a natural or synthetic nucleobase, optionally substituted by protecting groups and capable of forming Watson-Crick or Hoogsteen base pairs, and

the residues R^1 and R^2 are independently hydrogen atoms, alkyl, alkenyl, alkaryl, aryl, or alicyclic groups containing up to 20 carbons, whilst at least one of the residues R^1 and R^2 exhibits one or more phosphite ester, phosphonic acid, or carbaborane functions.

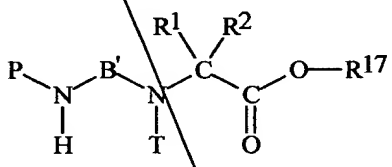
2. A compound as defined in claim 1, comprising a total of up to 50 of the said units W, U and Z.

3. A compound as defined in claim 1 or claim 2, wherein W is a hydrogen atom, U one or more units of formula Y, and Z an OH group.

4. A compound as defined in any of the previous claims, wherein at least one of the residues R^1 and R^2 exhibits one or more phosphite ester or phosphonic acid functions.

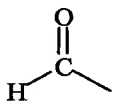
5. A compound as defined in any of the previous claims, wherein at least one of the residues R^1 and R^2 exhibits one or more carbaborane functions.

6. A compound of the general formula **II**



II

in which T is hydrogen or a group of the formula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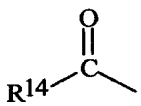
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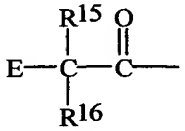

the residue R^{17} is hydrogen or allyl, benzyl, ethyl, methyl, 2,2,2-trichloro-tert-butyl, 2,2,2-trichloroethyl, α-chloro-(trifluoromethyl)benzyl, 2-(p-toluenesulfonyl)ethyl, diphenylmethyl, 2-(trimethylsilyl)ethyl, methoxymethyl, (2-trimethylsilyl)ethoxymethyl, benzyloxymethyl, or (2-methoxy)ethyloxymethyl,

the residue P is hydrogen or an amine protecting group,

the residue R^{14} is a group of the formula CH_nX_{3-n} (n = 0 to 3, X = F, Cl, Br, I), a phenyl group, or a *p*-methoxyphenyl group, and

B', E, the residues R^1 und R^2, and R^{15} und R^{16} have the meanings stated in claims 1 to 5.

7. A compound as defined in claim 6, wherein the residue R^{17} is not a hydrogen atom and is bound to a solid phase.

8. A compound as defined in claim 6 or claim 7, wherein the amine protecting group is an Fmoc, Boc, Cbz, Mmt, or Bhoc protecting group.

9. A process for the production of a compound as defined in any of claims 1 to 5, wherein compounds as defined in any of claims 6 to 8 are converted in known manner.

10. A method of using a compound as defined in any of claims 1 to 5 for cancer therapy.

Summary

The invention relates to novel oligomers containing PNA units that are substituted by phosphite ester, phosphonic acid, or carbaborane functions and PNA monomers that are substituted by phosphite ester, phosphonic acid, or carbaborane functions, from which the novel oligomers are produced.